Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Advanced Television Systems	)	
and Their Impact Upon the	)	**MM Docket No. 87-268**
Existing Television Broadcast	)	
Service	)	
Fifth Further Notice of	)	
Proposed Rule Making	)	

COMMENTS OF THOMSON CONSUMER ELECTRONICS

July 11, 1996

TABLE OF CONTENTS

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COMMENTS OF THOMSON CONSUMER ELECTRONICS

I. Introduction

Thomson Consumer Electronics respectfully submits these comments on the Commission's Fifth Further Notice of Proposed Rule Making ("NPRM") in its Advanced Television ("ATV") proceeding. The NPRM seeks comment on the Commission's proposal to require digital television licensees to use the digital television ("DTV") transmission standard recommended to the Commission by its Advisory Committee on Advanced Television Service ("Advisory Committee"). This recommended standard is based on the *digital* HDTV Grand Alliance system and has been documented and endorsed by the Advanced Television Systems Committee ("ATSC") and published as the ATSC Digital Television Standard.

Thomson strongly urges the Commission to finalize as soon as possible its tentative decision to adopt the ATSC DTV Standard and to require digital broadcast licensees to use the full standard. Thomson and dozens of other firms and organizations have collectively invested more than $500 million and the best efforts of hundreds of their people over the last nine years

based on the Commission's commitment to adopt a single DTV standard based on the recommendation of its Advisory Committee. We believe it is essential that the Commission adopt a single, complete DTV standard as rapidly as possible in order to provide reliable guidance and clear direction to broadcasters, broadcast equipment manufacturers, consumer electronics manufacturers, and consumers. Furthermore, we believe that the ATSC DTV Standard utilizes world-leading digital technology that offers unprecedented and unmatched flexibility with headroom for growth, fully meets and even exceeds the Advisory Committee's stringent and comprehensive requirements, and is the best possible standard to adopt.

Four major benefits will result from the swift adoption and implementation of the ATSC DTV Standard. First, our nation's unequaled system of free over-the-air television will be preserved and enhanced by providing broadcasters with the ability to upgrade their service to digital technology, allowing them to offer consumers the quantum improvements in video and audio quality that will be essential for broadcasters to compete successfully against other video delivery media in the years and decades to come. Second, with digital television, especially high-definition digital television ("HDTV"), consumers will not only receive dramatically improved pictures and sound, they will also gain access to a host of other innovative information services, due to the generalized data delivery capability of the system and the high-resolution displays used to provide HDTV. Third, a swift transition to digital television will allow the Commission to "refarm" the television spectrum into a vastly more efficient utilization, recovering perhaps as much as 150 MHz of nationwide contiguous spectrum in the process. Finally, prompt action by the Commission to mandate the ATSC DTV Standard will unleash tremendous investment in broadcast infrastructure, manufacturing facilities, and consumer equipment that will create and preserve tens of thousands of high-skill, high-wage jobs and engender strong growth in our nation's economy.

Our nation has the world's best digital television technology in hand. All that remains is for the Commission to act to bring these benefits to the American public.

II. Background

Headquartered in Indianapolis, Indiana, Thomson is a major manufacturer and marketer of color TV receivers, related video hardware, and a full range of consumer electronics products. Perhaps best known for its RCA, GE and ProScan brands, Thomson is the market leader in U.S. sales of color TV receivers, VCRs and most recently digital set-top receivers.

Thomson is also the largest employer in the U.S. consumer electronics industry, with nearly 10,000 Americans working in six major manufacturing sites with sales and distribution facilities across the nation. Thomson manufactures all of its large-screen color TVs in this country. These sets are designed in Thomson's engineering facility in Indianapolis and manufactured in its Bloomington, Indiana color TV assembly plant. Key components such as picture tubes, printed circuit boards, and cabinetry are produced at other Thomson facilities in the U.S.

Building on its manufacturing and marketing expertise in the color television business, Thomson has also established itself as the industry leader in digital television in the United States. For example, Thomson designed and developed the digital encoding and decoding hardware required to bring the DirecTV broadcast satellite service to the American public. Hailed as the most successful introduction ever of a consumer electronics product, over 2.5 million Digital Satellite System dishes and receivers were purchased in the first 24 months. In addition, Thomson recently won a competitive bid and was awarded a contract by TeleTV to provide three million digital set-top converters to support the introduction of digital television services by Bell Atlantic, NYNEX and Pacific Bell.

Most important, Thomson has been heavily involved in and made substantial contributions to the development of digital over-the-air broadcast television technology. As a member of the Advanced Television Research Consortium ("ATRC"), Thomson helped develop and construct an all-digital HDTV system that was chosen by the Advisory Committee as one of four finalist systems in 1993. At that time, with strong encouragement

from the Commission and its Advisory Committee, Thomson agreed to combine its efforts with those of the other finalists to form a best-of-the-best system, and the *digital* HDTV Grand Alliance was born. Within the Grand Alliance, Thomson has made particular contributions in developing the packetized data transport system which is essential in providing the unequaled flexibility, extensibility and interoperability of the system.

After an arduous but productive nine-year process, the U.S. has developed the world's best digital television system. Now it is incumbent upon the Commission to ratify the work of its Advisory Committee, and begin the process of upgrading the nation's broadcast television infrastructure by adopting the ATSC DTV Standard based on the Grand Alliance system. Thomson fully endorses the comments filed by the Grand Alliance, the ATSC, and the EIA/ATV Committee, and offers these additional comments to help guide the Commission in adopting policies that will promote the rapid introduction of digital television.

III. The Commission's Tentative Decision to Mandate Use of All Elements of the ATSC DTV Standard Is Vital

Thomson agrees with the other members of the Grand Alliance, the ATSC, and the EIA/ATV Committee that a standard is required in order to provide the certainty and reliability necessary for broadcasters, manufacturers and consumers to invest in digital television; that a clear, unambiguous standard is necessary to provide a reliable basis for the design of broadcast and consumer equipment; and that an FCC requirement *mandating* the use of the DTV standard by digital broadcast licensees is necessary to achieve these goals.

In the first place, contrary to some of the academic, theoretical misgivings mentioned in the NPRM, mandating use of the DTV standard would not be a case of government imposing an unproven, inflexible standard, but would be a matter of reinforcing an extremely broad industry consensus around proven, tested, world-leading technology, thereby providing the confidence to allow all segments of the industry to implement the service rapidly.

Moreover, as the Commission has noted (NPRM at ¶36) and Commissioner Chong has reinforced in her separate statement, free over-the-air broadcast television service is a unique service upon which more than 98 per cent of Americans rely, either directly or indirectly, not just for entertainment and sports, but for news, education, political discussion, and information. It is fundamental to the well-being of our democratic society and a unique part of our American culture.

When consumers purchase digital television receivers, they must be assured that those sets will receive all local channels, and that if they move across the country, the set will function properly and their investment will be protected. Without such assurances, consumers would be reluctant to purchase, and the whole transition to digital television would be prolonged or entirely thwarted, frustrating all of the Commission's major objectives, including the recovery of spectrum.

The NPRM (at ¶¶23-26) gives a detailed summary of its previous deliberations and actions regarding whether or not the Commission should set a single standard, demonstrating that the Commission has consistently intended to set a single standard and that such a course has enjoyed widespread support across the affected industries. Nevertheless, the NPRM highlights two "recent" developments that might arguably justify a different conclusion: first, the presence now of a single consensus standard might make it unnecessary to mandate a single standard; and second, the opportunity afforded by digital transmission technology for each licensee to offer a unique set of services might make it less desirable to require a particular standard. (NPRM, ¶¶27-28) The first point overlooks the fact that the Commission's clear intention to select a single standard was central in motivating the formation of the Grand Alliance, and in driving the industry to endorse the ATSC DTV Standard. Removing the assumption that the Commission would mandate a single standard would threaten the industry consensus and inject a great deal of uncertainty, risk and delay that would jeopardize a swift transition to digital television and the rapid recovery of valuable television spectrum.

The second noted change, the development of an all-digital system, far from calling into question the Commission's earlier decisions to mandate a standard, actually strongly reinforces the wisdom of doing so. The all-digital system represented by the ATSC DTV Standard brings flexibility and extensibility undreamed of previously, so the Commission's earlier concerns about an *inflexible* standard have been addressed, and the strong consensus view expressed in 1988 and adopted by the Commission in 1990 applies with greater force today.

Thus, the Commission's decision to require the use of a single broadcast standard is correct and essential. A mandated single standard will protect consumers, promote a swift transition, drive broadcaster and consumer costs down more rapidly, allow the Commission to recover extremely valuable television spectrum as soon as possible, and promote employment and economic growth.

Furthermore, Thomson believes that all layers of the ATSC DTV Standard should be adopted. The Advisory Committee and the ATSC have given careful consideration to what is essential in a standard, and have proposed the minimum essential requirements to provide broadcasters and equipment manufacturers the information and assurances they need, yet allow tremendous room for flexible use, for product and service differentiation, and for enhancements. Any proposal to limit the mandated aspects of the standard to certain layers of the standard would inject uncertainty and unreliability, jeopardizing a smooth and rapid transition to digital television.

Thomson agrees with the other members of the Grand Alliance, the ATSC and the EIA/ATV Committee that the concerns expressed in the NPRM at ¶¶42-47 regarding the potential obsolescence of the DTV Standard are greatly exaggerated, and we strongly believe that a sunset provision on the mandatory use of the ATSC DTV Standard is completely unnecessary and would undermine the Commission's goal to promote a smooth and swift transition. Any suggestion now that the standard may soon become obsolete or superseded is wrong and would send inappropriate and counterproductive signals to broadcasters, to

manufacturers and especially to consumers. We believe that the Commission can safely rely on its existing processes and on industry groups, including the ATSC, to identify any need for modifying the standard, including any proposal in the future to make its use nonmandatory.

The NPRM at ¶48 seeks comment on several alternative approaches to requiring the use of the full standard. Thomson believes these would not be effective, and urges the Commission not to consider them further.

Authorizing the use of the standard and prohibiting interference to it, but not requiring the use of it, would not provide the degree of certainty and reliability required to justify the substantial investments required of broadcasters, manufacturers and consumers for the conversion to digital television. Consumers must be assured that when they purchase a digital television receiver it will meet all performance claims, will receive broadcasts anywhere in the country, and will not be rendered obsolete or deficient due to incompatible changes in broadcast equipment. Likewise, broadcasters must have confidence that widely available receivers from all manufacturers will be compatible with the signals they transmit, and that incompatible improvements in receiver designs will not impair or prevent the reception of their broadcasts. Such a weak approach as this "allow, but don't require" option would not provide a sound basis for design or purchase, and would likely render the transition to digital television stillborn and make it impossible for the Commission to recover valuable television spectrum.[1]

Adopting a standard for allocation and assignment purposes only, another possibility mentioned in ¶48, would be even worse than the "allow, but don't require" approach -- suffering all the same frailties, but worse yet, failing to guarantee that one user of the

[1]The AM stereo radio example shows the folly of failing to establish a single clear standard. With AM stereo, rather than authorize a single standard, the Commission decided to permit multiple standards and rely on the marketplace to sort out the best approach. Early attempts at multi-standard receivers were abandoned by manufacturers due to the cost and difficulty of achieving adequate performance, and the service has never been successful, even though agreement on a single standard was finally achieved more than ten years later at the direction of Congress. In contrast to the AM stereo radio debacle, with FM stereo radio service the Commission established a single clear standard, and the service became an immediate success in the marketplace.

broadcast spectrum would not interfere with DTV broadcasts in adjacent spectrum or in adjacent geographical areas, or with NTSC broadcasts during the transition period. Such an approach simply will not provide the certainty and clear direction that are required to get mutually dependent broadcasters, manufacturers and consumers to make consistent, reinforcing investment decisions.

Similarly, mandating the use of only some layers of the ATSC DTV Standard would also be inadequate and ineffective. Throughout the nine-year Advisory Committee process, careful attention was paid to identifying what minimum aspects of the standard needed to be mandatory, and what could be left for differentiation and innovation in the marketplace. We believe the recommended standard strikes the right balance. While requiring only the RF/transmission layer of the standard theoretically would guarantee against harmful interference, it would not give broadcasters, manufacturers and consumers assurance that a reliable, consistent, and compatible nationwide digital television service would ever materialize, creating tremendous uncertainty that would stifle investment and probably render DTV stillborn.

The NPRM at ¶54 invites comment on the acceptability of the ATSC DTV Standard. We believe that this standard, based on the Grand Alliance system, is not only acceptable, it represents the world's best digital television system and has won remarkably broad support and acceptance throughout the affected industries. Lingering complaints by a few members of the computer and motion picture industries are not new issues and are not well-founded -- they have been discussed and debated thoroughly over a period of many years, and have not withstood the scrutiny of peer review in a consensus-driven process.

As discussed in more detail below, the ATSC DTV Standard is more easily interoperable with computers and telecommunications than any other digital television service ever conceived -- due in no small part to the involvement of representatives of the computer and telecommunications industries in the Advisory Committee process over the last five years. In the NPRM at ¶54, the Commission correctly recognizes the unmatched capability and

flexibility of the system and the collective genius of its many creators, properly notes the years of thoughtful consideration and expert research and development in an open process in which all interests were able to participate, and correctly concludes that the burden of persuasion should be on any who would oppose the Commission's decision to mandate use of the ATSC DTV Standard.

IV. The ATSC DTV Standard Provides More than Adequate Interoperability with Alternative Media

In the NPRM (at ¶62), the Commission requests comment on the Advisory Committee's conclusion that the ATSC DTV Standard provides adequate interoperability with alternative media, on whether any critical interoperability problems remain, and on what other actions, if any, the Commission might take to facilitate interoperability. Thomson is convinced that the ATSC DTV Standard provides *far more than adequate* interoperability with alternative media, that no critical interoperability problems remain, and that the Commission need not take any further actions to facilitate interoperability. As noted above, none of the objections raised by certain members of the computer and motion picture industries are new issues. They have been debated repeatedly and thoroughly, and addressed fully in the recommendation adopted without objection by the Advisory Committee members, including members of these industries. Moreover, the Advisory Committee recommendation enjoys a remarkably broad consensus, as further evidenced by the nearly unanimous vote by nearly fifty ATSC members to adopt the ATSC DTV Standard. In stark contrast, there is no consensus whatsoever for the counter-proposals offered by the few detractors of the proposed standard.

A. Computer Interoperability

Thomson fully endorses the extensive comments offered by the Grand Alliance and the ATSC on this topic, and we offer here additional insights on this subject. In the competitive phase of the Advisory Committee effort, Thomson and its ATRC partners proposed and

developed an all-digital HDTV system using an interlaced scanning format, in part because it permitted us to support approximately 1,000 lines of picture resolution at 60 Hz and still fit within a 6 MHz terrestrial channel. The most important breakthrough in achieving an agreement to form the Grand Alliance and build a best-of-the-best system, however, was the finding that we could build a primarily progressive scan system, yet still support a 1,000-line, 60 Hz interlaced HDTV format as well with only very modest additional cost. Thus, by supporting multiple formats, the needs of a wide range of different users and different applications could be met simultaneously.

In combining the best interoperability features of the predecessor all-digital systems and also incorporating other changes required by the Advisory Committee, the Grand Alliance designed, built and tested the most interoperable broadcast television system ever conceived. The system's all-digital layered architecture, its packetized data transport structure, its use of headers and descriptors, its support of multiple picture formats and frame rates with a heavy emphasis on progressive scan and square pixels, and its compliance with MPEG-2 international compression and transport standards, give it unrivaled interoperability with computers and telecommunications. However, although the ATSC DTV Standard based on the Grand Alliance system abundantly provides features to promote interoperability with computers and telecommunications, some in the computer industry want to *prohibit* features that other industries deem vital to promote interoperability with systems and equipment and archived program material used in *their* industries.

Thomson finds it ironic that the proposed ATSC DTV Standard is the *only* digital television development effort in the world that stresses progressive scan and square pixels. If the Commission were to delay adoption of the Advisory Committee recommendation out of a concern over a limited amount of interlaced scanning, it would only serve to reinforce interlaced scanning as the predominant mode for digital television throughout the world. Digital television systems and standards that exclusively utilize interlace scanning and non-square pixels are beginning to proliferate throughout Europe and the rest of the world,

including the United States, while some members of the computer industry attempt to derail the Commission's nine-year process at the last minute, ostensibly because the proposed transmission standard *permits some* interlaced scanning. Given these facts, we cannot help but wonder whether the true motive of these detractors is to offer up any objection -- no matter how groundless -- that might have a chance to derail this process, presumably to obtain some perceived future competitive advantage for themselves.

As described more fully in the Grand Alliance and ATSC Comments, computer-friendly progressive scanning has always been a cornerstone of the Grand Alliance HDTV system, which uses progressive scan for five of the six HDTV formats. All material originally produced on film, including all motion pictures and approximately 80 per cent of today's prime time television programming, will always be transmitted using progressive scan, and other video material such as news and sports programs may or may not be broadcast in progressive scan at the discretion of the broadcaster. In addition, *all* of the HDTV formats, including the lone interlaced format, are square pixel formats, an important characteristic for facilitating interoperability with computers. What's more, the SDTV transmission formats proposed by the Advisory Committee also stress progressive scan, comprising nine of the twelve SDTV formats in the ATSC DTV Standard.[2] This means broadcasters and others can easily use progressive scan transmission formats for program material where it offers better performance, or for applications that use text and graphics, or for other video that is likely to be viewed on computers.

Thomson endorses the extensive discussions in the Grand Alliance and ATSC Comments regarding the benefits and acceptability of using interlace scanning formats for certain classes of applications. Beyond these technical arguments, however, insistence on *banning* interlaced formats is unwarranted. The ATSC DTV Standard contains numerous progressive scan and square pixel formats to support the applications that benefit from those

[2]Thus, 14 of the 18 DTV formats are progressive scan formats.

attributes. Neither program producers, broadcasters, nor consumers will be forced to *use* an interlaced format simply because it exists in the standard. On the other hand, there is no doubt that broadcasters will transmit tremendous amounts of material using progressive scan -- all motion pictures and most prime time programming at a bare minimum. And for non-film-based video, if judged superior by the marketplace, the use of progressive scan transmission formats will surely proliferate. Likewise, television receivers with progressive scan displays will predominate among consumers if they offer better price/performance characteristics. Indeed, Thomson and other television manufacturers have already announced plans to include progressive scan *displays* in their initial HDTV product offerings, and some broadcasters have stated that they are leaning toward the use of progressive scan transmission formats for HDTV.

The Commission's overriding goal in this proceeding is to preserve and enhance free over-the-air television service, including the adoption of policies that will allow digital television infrastructure and applications to contribute to improving the National Information Infrastructure. The ATSC DTV Standard based on the Grand Alliance HDTV system has answered this challenge with the world's best digital television system, offering unmatched interoperability with computers and telecommunications, far surpassing the Commission's expectations when it initiated this historic process nine years ago.

B. Aspect Ratio

Some cinematographers have objected to the 16:9 aspect ratio included in the ATSC DTV Standard, saying that it will limit broadcasters' ability to display the full artistic quality of their work. The problem is that since cinematographers use a variety of aspect ratios, no one aspect ratio can be ideal for all motion pictures. Indeed, even now, there is no consensus among those dissatisfied with the 16:9 ratio as to what the ideal ratio should be. Moreover, an aspect ratio wider than 16:9 is not ideal for many types of video programming such as news broadcasts, one-on-one interviews, or speeches or educational lectures.

The decision to standardize on 16:9 for a video wide aspect ratio was reached more than a decade ago after extended and careful deliberations with extensive participation by the

motion picture and television production community. The 16:9 aspect ratio has long since been adopted in a variety of international standards bodies, and manufacturers around the world have been building CCD sensing arrays, camera lenses, production equipment, picture tubes, and widescreen receivers in the 16:9 format for years. Changing the aspect ratio for broadcast DTV at this late date would increase costs to consumers, would cause unacceptable and unnecessary delays in implementing DTV service, and would severely damage many parties who have already made significant investments leading to DTV service.[3] Ironically, these increased costs and delays would allow 4:3 standard-definition digital television services to become entrenched, and cinematographers might see their motion pictures severely letter boxed or cropped for the indefinite future. The Commission must not permit second-guessing of the aspect ratio decision ten years after the fact to delay or derail the swift adoption and implementation of the ATSC DTV Standard.

C. Interoperability with Cable and Other Delivery Media

Although the Advisory Committee's charter was to recommend a *terrestrial broadcast* ATV transmission standard, from the beginning the easy interoperability of the broadcast ATV standard with cable TV systems was a key objective in the development of the Grand Alliance system and the ATSC DTV Standard. Indeed, the Grand Alliance transmission system and the ATSC DTV Standard include a 16 VSB high-data-rate mode which can be utilized over cable systems to deliver a 43 Mbps payload, which can support, e.g., two simultaneous live-action HDTV sports programs over a single 6 MHz cable channel.

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[3]The 16:9 aspect ratio is a pervasive worldwide standard for video displays. Most manufacturers with display production facilities in the U.S., including Thomson, Philips, Zenith, Hitachi, Matsushita, Toshiba and Sony have already invested in tube manufacturing and assembly plant modifications to accommodate anticipated production of 16:9 displays. In the case of Thomson, with the largest U.S. manufacturing facilities, in excess of $200 million has been invested in facility upgrades. If the aspect ratio were to be changed at this late date, a significant portion of this investment would be lost. Worse yet, we believe that such a change would impose a twelve-to-eighteen-month delay in the first delivery date for a direct-view television receiver. In addition, wider aspect ratios would significantly increase tube costs because of the additional glass required and the physical design challenge associated with maintaining shadow mask alignment.

Throughout the nine-year Advisory Committee process, the cable industry has made significant investments and contributions to ensure the suitability of the standard for carriage over cable systems. A significant portion of the Advisory Committee's laboratory and field tests were conducted by Cable Television Laboratories, Inc. ("CableLabs") and focused on ensuring that the digital HDTV system developed for terrestrial broadcast would also meet the needs of the cable industry. Thomson believes that as voluntary standards activities continue in the cable industry, as well as for DBS, MMDS and ITFS services and for open video systems, it is likely that many elements of the terrestrial ATV standard will also be incorporated in emerging standards in these industries. Indeed, the ATSC DTV Standard should provide the core for these emerging standards. We believe that the development of these standards will promote the early availability of digital television, including HDTV, over all of these other media as well as terrestrial broadcasts, without causing undue burdens on cable operators or other providers.

V. Other Issues

A. Receiver Standards

In the NPRM at ¶66 the Commission asks whether it should require that receivers (and set-top boxes designed to receive ATV broadcasts for display on NTSC sets) be able to receive adequately all DTV formats. In comments on the Fourth NPRM, Thomson (as well as all other receiver manufacturers who filed comments) stated the belief that marketplace forces would dictate that all DTV receivers would be capable of *receiving* all DTV formats, without any FCC requirement to do so. We further stated that although a requirement is unnecessary, we would support such a requirement if it were coupled with a requirement that broadcasters transmit minimum amounts of HDTV. However, we argued strongly that the Commission should not regulate the manner in which the received signals are *displayed*, but should rely on marketplace forces and give manufacturers the latitude to differentiate their products and meet varying consumer needs.

Since last November when those comments were submitted, broadcasters have made crystal clear that they intend to transmit substantial amounts of HDTV programming over their DTV channels. It would be foolhardy for any manufacturer to offer digital sets in the marketplace that go dark for any programming, much less a substantial amount of broadcast programming. Consequently, it is unnecessary for the Commission to impose a requirement that all digital receivers and converters receive all of the formats in the ATSC DTV Standard. Nevertheless, Thomson would support such a requirement if it is accompanied by a requirement that broadcasters transmit minimum amounts of HDTV programming.

Regarding other aspects of the reception performance of receivers, Thomson appreciates the concerns of broadcasters that predicted broadcast coverage areas cannot be achieved without adequate receiver performance. However, we have no doubt whatsoever that the same marketplace forces that operate today to ensure that television manufacturers provide adequate reception performance will continue to motivate us all to compete to provide high-quality receivers. Nevertheless, we intend to work with broadcasters through the recently formed ATSC Implementation Subcommittee to ensure that their concerns are met. If the Subcommittee determines that minimum performance levels need to be established for DTV receivers, we believe they should be the subject of voluntary industry standards, just as they have been for many years with the current analog system, and we would then work with the ATSC and the Consumer Electronics Manufacturers Association to establish such standards.

B. Licensing of Technology

As the Commission notes in ¶67 of the NPRM, the Advisory Committee made clear early in its deliberations that the proponents of any DTV system would be required to offer licenses under reasonable and nondiscriminatory terms for their intellectual property necessary to implement a standard based on their proposed system. Thomson has always supported the Commission's objective to make this technology broadly and rapidly available, and we and the

other members of the Grand Alliance have given the ATSC written commitments to abide by this requirement. Moreover, we don't perceive any particular issue with pending patents -- whenever any Grand Alliance member's technology necessary to implement the standard becomes patented, it will fall within the commitment to license on reasonable and nondiscriminatory terms. We believe no further Commission action is required to ensure easy and nondiscriminatory access to the intellectual property necessary for a rapid implementation of the ATSC DTV Standard.

C. International Trade

Thomson believes that the ATSC DTV Standard based on the Grand Alliance system represents the best digital television technology in the world, fully encompassing both HDTV and SDTV as well as a host of other potential applications, and offering unmatched interoperability with computers and telecommunications through its use of a packetized data transport structure and its emphasis on progress scanning and square pixels. We are anxious to make the benefits of this system available not only here in the United States but also to service providers and consumers in countries throughout the world. We believe the most important thing, by far, the Commission can do to facilitate international compatibility and to promote export opportunities is to adopt the ATSC DTV Standard as rapidly as possible for use by digital broadcast licensees in the United States.

VII. Conclusion

The ATSC DTV Standard based on the Grand Alliance HDTV system represents the world's foremost digital broadcast television system, with tremendous flexibility and ability to incorporate future improvements. Implementing this technology will bring consumers quantum improvements in the technical quality of free over-the-air television, and give them access to a host of potential innovative information services as well. Moreover, a swift transition to digital broadcast television will permit the Commission to move to a vastly more efficient utilization of television spectrum, recapturing huge amounts of invaluable nationwide,

contiguous spectrum in the process. In addition, a rapid transition will create and preserve tens of thousands of high-skill, high-wage jobs, and engender substantial economic growth.

Commission action to bring this lengthy process to a successful conclusion is long overdue. Thomson strongly urges the Commission to act now, to follow through on its commitment made to industry repeatedly over the past decade to set a new broadcast television standard, to adopt the full ATSC DTV Standard without further delay, and to mandate its use by digital broadcast licensees. In so doing, the Commission will provide the clarity, confidence, and stability required by financiers, broadcasters, manufacturers and consumers to galvanize an entire industry into action, unleashing the further substantial investments necessary to bring the benefits of this promising technology to the American public and to spread those benefits throughout the world.

Respectfully submitted,

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